

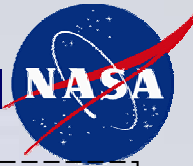
WINCOMM Project Overview

WxAP Annual Review, 2004

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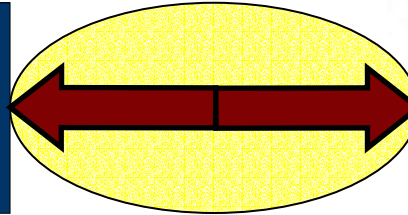
WINCOMM Goals

WxAP: Weather Information Communications



Air

**Weather Hazard
EPIREPS**



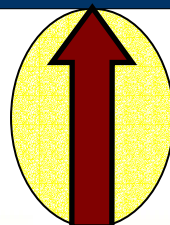
**Weather Hazard
EPIREPS**

Tactical Information

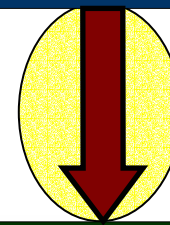
Strategic Information

Air

**Cockpit Processing,
Presentation
& Decision Aids**



**Airborne Weather
Sensor Information**



Ground

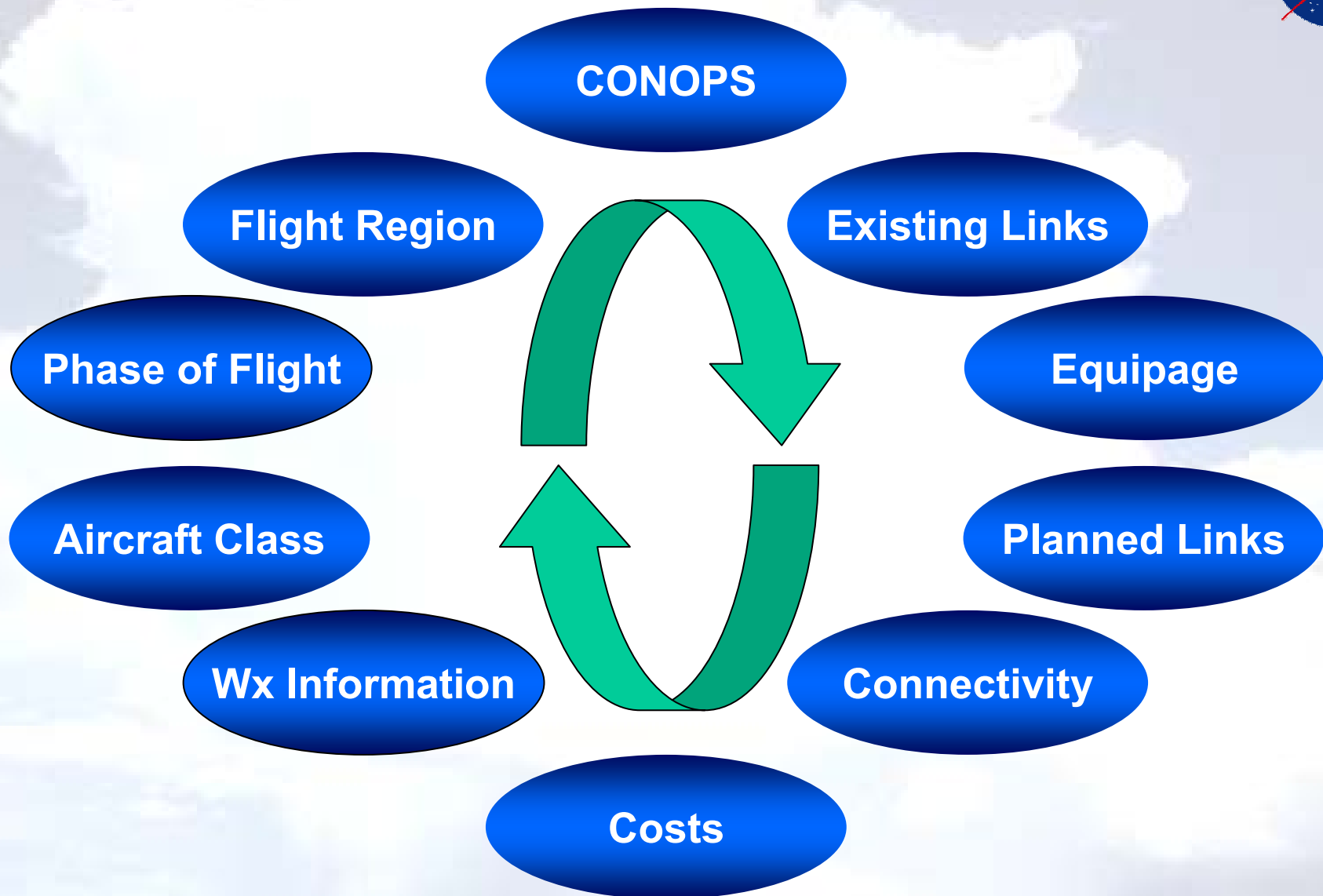
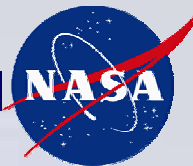
**Aviation Wx
Information**

**Forecasters & Weather
Product Developers**

Data Link Decision Factors

Aviation
Safety &
Security
Program

WxAP: Weather Information Communications

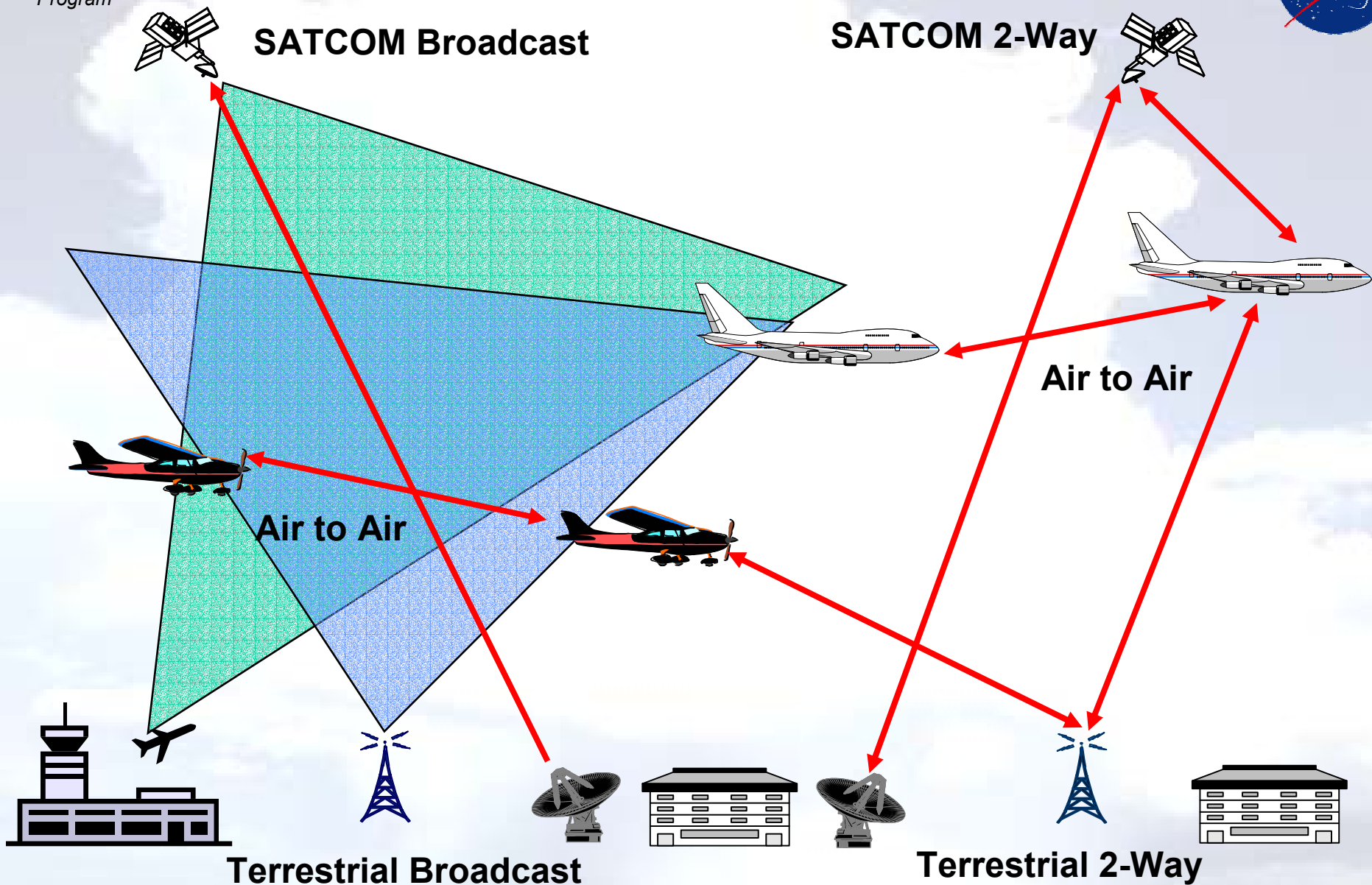


Datalink Architectures

(weather information dissemination)

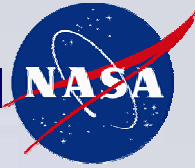
Aviation
Safety &
Security
Program

WxAP: Weather Information Communications



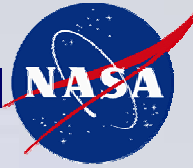
Datalink Validation Goals

WxAP: Weather Information Communications



- Perform Successful Transmission and Reception of Wx Information
- Show Wx Information flow does not impact “Normal” Traffic
- Demonstrate Feasibility of Operational Implementation
- Lay Foundation for Future Data Link Development

Product Deliverables



- National Capability for Commercial Transport Weather Dissemination
- National Capability for GA/Regional Weather Dissemination
- Global Capability for Weather Dissemination
- Advanced Data Link Technology Candidates for Weather Dissemination

WINCOMM Structure

WxAP: Weather Information Communications



Weather Information Communications Project (WINCOMM)

Mike Jarrell

Integration,
Testing &
Validation

Jim Griner

System
Engineering

Tom Tanger

Commercial
Transport
En-Route

Jim Griner

General Aviation
/ Regional
En-Route

Don Hilderman

International
/ Oceanic
En-Route

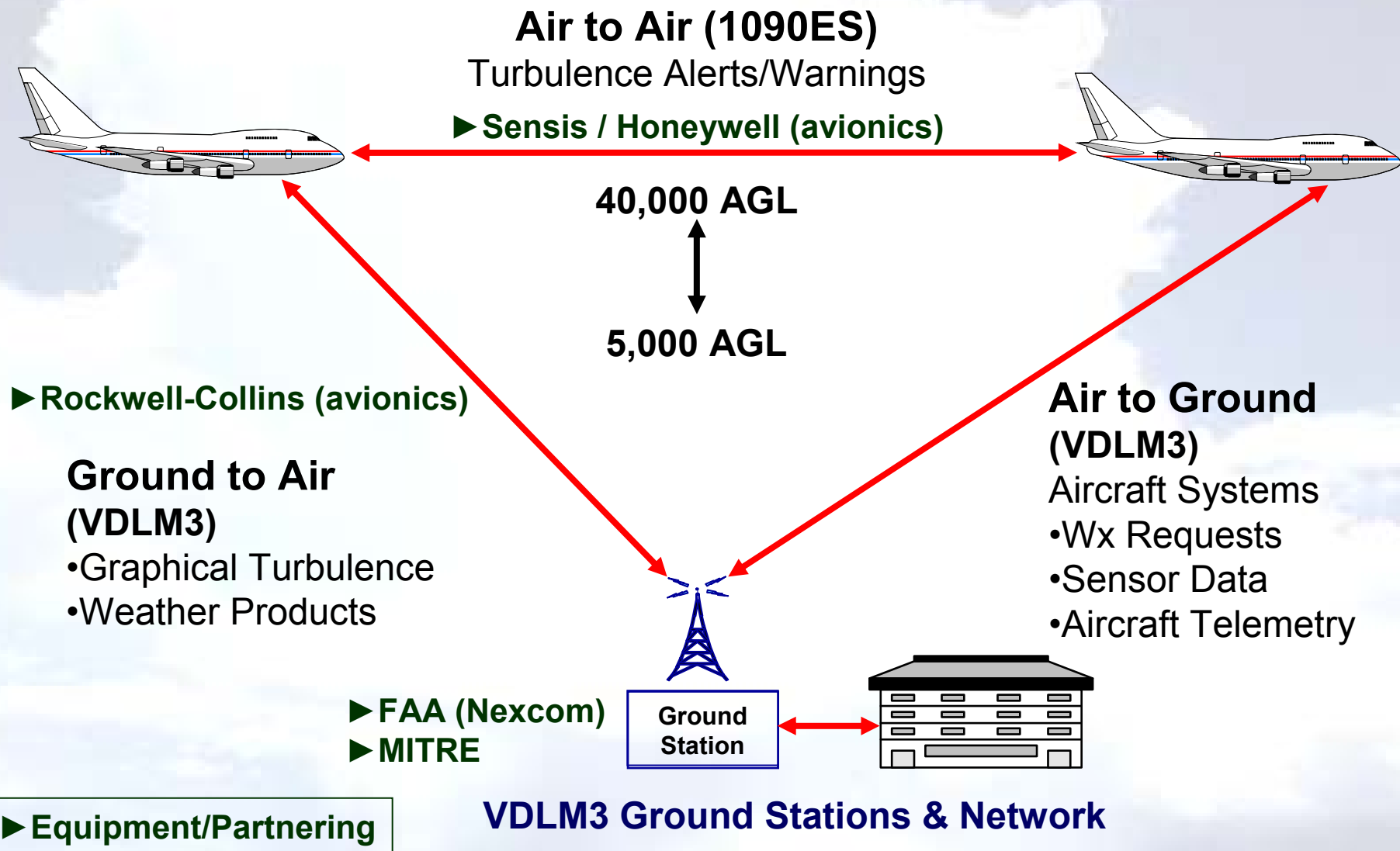
Rich Slywczak

Advanced
Datalink
Development

Tom Tanger

Commercial Transport En-Route

WxAP: Weather Information Communications



Regional/General Aviation En-Route

WxAP: Weather Information Communications



► JHU-APL: Partnership for Engineering, Integration, Validation

Air to Air

- Atmospheric Sensor Data
- Aircraft Telemetry

► Garmin (avionics radio)



40,000 AGL



5,000 AGL

Ground to Air

- Graphical Wx Products
- Textual Wx Products

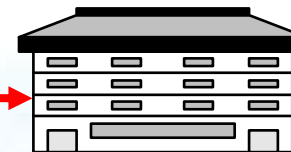
Air to Ground

- Atmospheric Sensor Data
- Aircraft Telemetry



- FAA (SF21)
- MITRE
- Sensis

Ground
Station

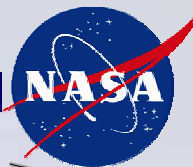


► Equipment/Partnering

FAA – UAT Ground Stations & Network

International/Oceanic En-Route

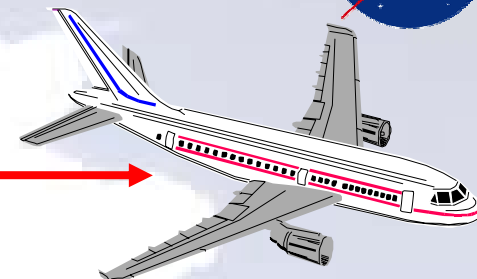
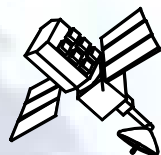
WxAP: Weather Information Communications



Air to Air

(Air-Ground-Air Routing)

- Turbulence Alerts/Warnings

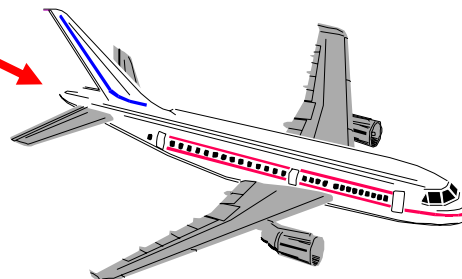


► EMS (avionics)

Air to Ground

Aircraft Systems

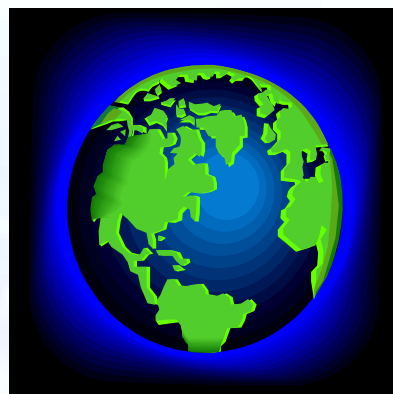
- Sensor Data
- Aircraft Telemetry



Ground to Air

Ground Systems

- Reports & Forecasts
- Alerts / Warnings



► SITA



**Inmarsat Swift 64 &
Network Service Provider**

National/Commercial
Weather Providers

AOC, Dispatch, ATC

► Equipment/Partnering

Advanced Data Link Technologies

WxAP: Weather Information Communications



- Aviation Cellular
 - Investigation of 4G and 5G cellular systems leading to the development of a Proof-of-Concept (POC) aviation cellular system data link solution utilizing existing public infrastructure
- Reconfigurable Antenna (Honeywell – ESCAN)
 - A Proof of Concept reconfigurable aero antenna spanning 800 MHz to 2.6 GHz will be developed
- Radio on a Chip (Honeywell – ASIC)
 - Size and cost reduction enabling compact radio designs with capability and flexibility through programmability to all VHF aviation NAV/COMM bands

Weather Information Datalinks

WxAP: Weather Information Communications



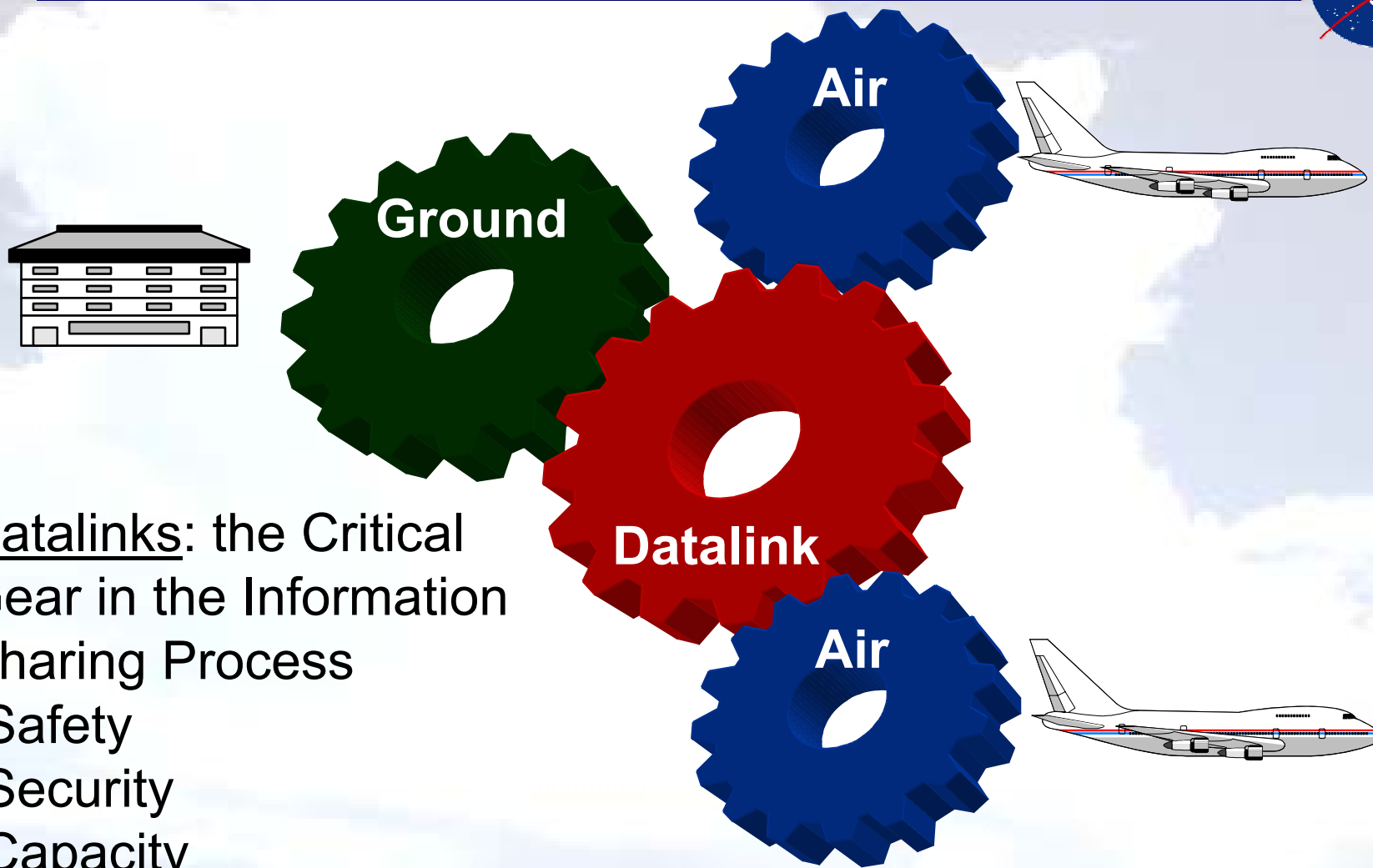
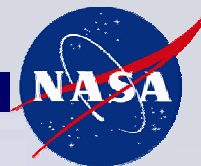
Where we are.



Where we need to be.

Enabling Role of Datalinks

WxAP: Weather Information Communications

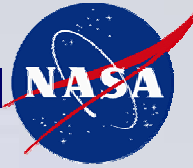


Datalinks: the Critical
Gear in the Information
Sharing Process

- Safety
- Security
- Capacity
- Efficiency

Total System Solutions Required

WxAP: Weather Information Communications



Weather Information

+

Delivery to Key Decision Makers

- Forecasters
- Controllers
- Pilots
- Automated Control Systems

+

Resultant Action

Safety Benefit

Aviation Data Link Capacity

Aviation
Safety &
Security
Program

WxAP: Weather Information Communications



**Limited
Use of
Commercial
Spectrum**

Graphical Wx

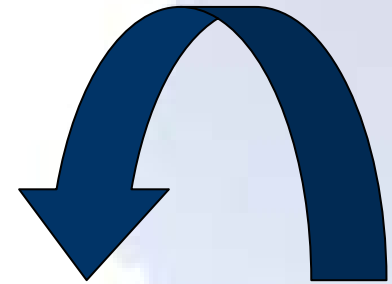
**Assigned
FAA
Spectrum**

Planned Systems

- Limited Wx
- Shared bandwidth

Legacy Systems

- Limited throughput
- Limited bandwidth



Reallocation



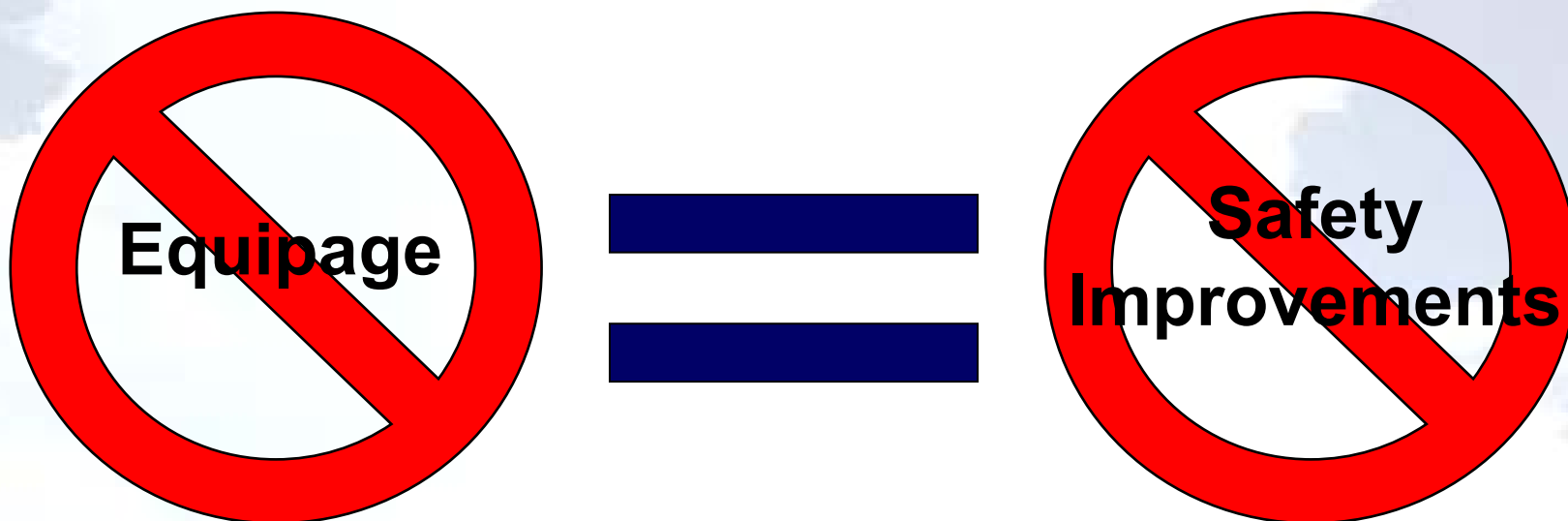
Aviation Data Link Cost

WxAP: Weather Information Communications



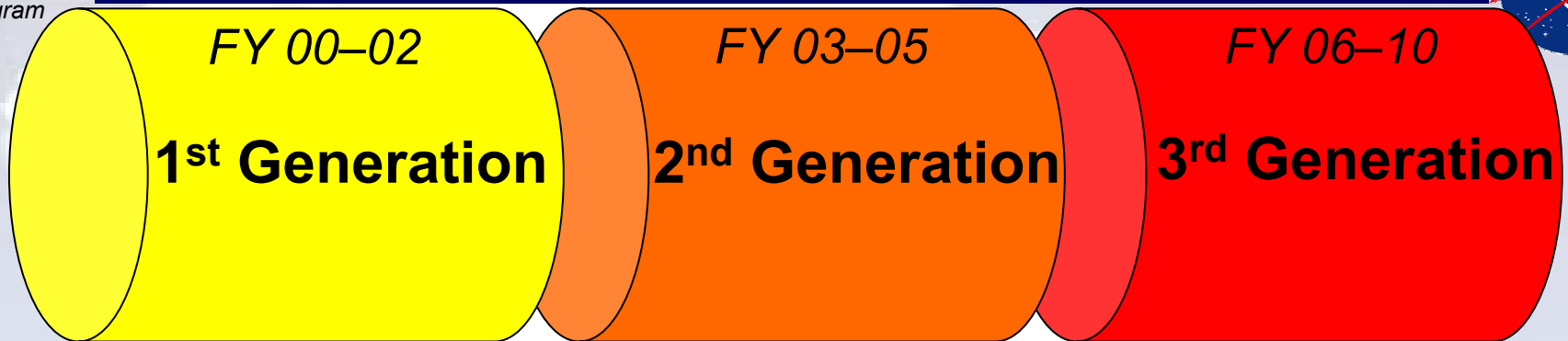
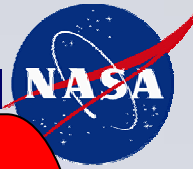
Aviation Data Link Cost

WxAP: Weather Information Communications



Aviation Data Link Development

WxAP: Weather Information Communications



- G-A Broadcast
- Private Networks
- Weather (Wx) Only
- Limited Capacity
- High Relative Cost
- GA

- FISDL (Terrestrial)
- WSI (Satcom)
- XM (Satcom DARS)

- G-A, A-G, A-A
- Private Networks
- Multi-Aviation Use
- Additional Capacity
- Increased Value
- GA & Com Transport
- EPIREPS
- A/C Wx Sensors
- Dynamic Requests

- UAT & VDLM3 (Terrestrial)
- Swift 64 (Satcom)
- 1090ES (Air-Air)

- Full Mesh Networking
- Public Infrastructure
- Information Pipeline
- Broadband
- Low Relative Cost
- All Aircraft
- Crosslinks
- Data Processing
- Routing

- Aviation Cellular
- High-Value Satcom

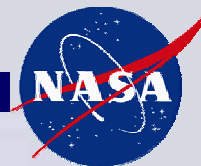
About Those Great Visions...

Aviation
Safety &
Security
Program

WxAP: Weather Information Communications



A vision without a plan
may be
a hallucination.



Thank You !

